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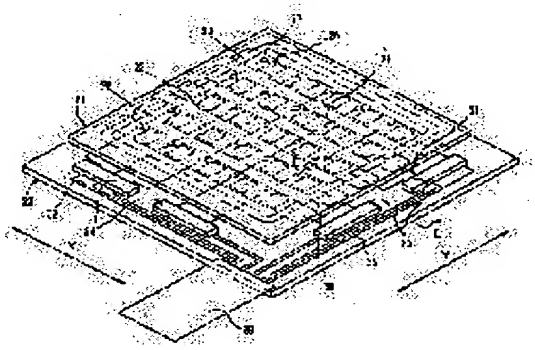
(54) LIQUID CRYSTAL DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To simplify the structure of a liquid crystal device and to reduce its cost by managing with one FPC.

SOLUTION: This liquid crystal device has a liquid crystal 23 charged between an element substrate 20 and an opposite substrate 21 through an annular sealant 22 and has a mounting surface of the element substrate 20 for a driver IC 24 connected to pixel electrodes 26 and a mounting surface of the opposite substrate 21 for a driver IC 25 connected to scanning-side electrodes 29; and the driver IC 24 is mounted on the element substrate 20 and the driver IC 25 is mounted on the element substrate 20 by leading the electrode terminal part of the opposite substrate 21 out to the element substrate 20 through a conduction part 30.



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CLAIMS

[Claim(s)]
[Claim 1] Liquid crystal is enclosed through an annular sealant between the 1st substrate and the 2nd substrate. It is liquid crystal equipment equipped with a component side of a driver IC connected to a component side of a driver IC connected to an electrode of said 1st substrate, and an electrode of said 2nd substrate. Liquid crystal equipment characterized by mounting a driver IC which pulls out an electrode terminal area of said 2nd substrate to said 1st substrate through the flow section, and is connected to this 1st substrate at an electrode of said 2nd substrate while mounting a driver IC connected to an electrode of this 1st substrate in said 1st substrate.
[Claim 2] Liquid crystal equipment according to claim 1 characterized by having mixed a conductive particle in said sealant and constituting said flow section.
[Claim 3] Said flow section is liquid crystal equipment according to claim 1 characterized by being a resin layer containing a conductive particle arranged on the outside of said sealant.
[Claim 4] Liquid crystal equipment which is liquid crystal equipment which liquid crystal was enclosed through an annular sealant between the 1st substrate and the 2nd substrate, and equipped said the 1st substrate and said 2nd substrate with a component side of a driver IC, respectively, and is characterized by pulling out wiring by the side of an input terminal of a driver IC mounted in said 2nd substrate to a component side of said 1st substrate through the flow section.
[Claim 5] Liquid crystal equipment given in any 1 term of claims 1-4 characterized by for said 1st substrate being an element substrate which has a switching element, and being the opposite substrate with which said 2nd substrate counters said element substrate, and is arranged.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] Liquid crystal is enclosed through a sealant between the element substrate which has a switching element, and the opposite substrate which counters it, and especially this invention relates to liquid crystal equipment equipped with the component side of the driver IC connected to the electrode of the component side of a driver IC and opposite substrate which are connected to the electrode of an element substrate.
[0002]
[Description of the Prior Art] As this conventional kind of liquid crystal equipment, what is shown, for example in drawing 7 is known. This liquid crystal equipment TFD which has conductor-insulating material-conductor structure as a switching element (Thin Film Diode: thin-film diode) Between the opposite substrates 2 by which opposite arrangement was carried out at this element substrate [with which the element was formed] 1, and element substrate 1 bottom Liquid crystal 4 is enclosed through the rectangular-head annular sealant 3, and project X side of the element substrate 1 in the direction of Y from X side of the opposite substrate 2, and a driver IC 5 is mounted in the upper surface of this lobe. Y sides of the opposite substrate 2 are projected in the direction of X from Y sides of the element substrate 1, and the driver IC 6 is mounted in the inferior surface of tongue of this lobe.
[0003] The output terminal of a driver IC 5 is connected to the pixel electrode 9 which is an electrode by the side of the element substrate 1 through the data line 7 and the TFD element 8 which are prolonged in the direction of Y, and the output terminal of a driver IC 6 is connected to the electrode terminal area of the counterelectrode 10 by the side of the opposite substrate 2 prolonged in the direction of X so that the pixel electrode 9 may be covered through the metal wiring 11.
[0004] On the other hand, the input terminal of a driver IC 5 is connected to FPC (flexible printed circuit board)12 attached X side of the element substrate 1 through the metal wiring 13, and the input terminal of a driver IC 6 is connected to FPC14 attached in Y sides of the opposite substrate 2 through the metal wiring 15.
[0005]
[Problem(s) to be Solved by the Invention] However, in this conventional liquid crystal equipment, since it is necessary to equip the element substrate 1 and the opposite substrate 2 with every one-sheet FPC of a total of two sheets, respectively, while structure becomes complicated, it is the hindrance of cost reduction.
[0006] This invention is made in order to cancel this un-arranging, and it aims at offering the liquid crystal equipment which can aim at simplification of structure, and reduction of cost.
[0007]
[Means for Solving the Problem] In order to attain this purpose, liquid crystal equipment concerning claim 1 Liquid crystal is enclosed through an annular sealant between the 1st substrate and the 2nd substrate. It is liquid crystal equipment equipped with a component side of a driver IC connected to a component side of a driver IC connected to an electrode of said 1st substrate, and an electrode of said 2nd substrate. While mounting a driver IC connected to an electrode of this 1st substrate in said 1st substrate, it is characterized by mounting a driver IC which pulls out an electrode terminal area of said 2nd substrate to

said 1st substrate through the flow section, and is connected to this 1st substrate at an electrode of said 2nd substrate.

[0008] According to this means, since FPC of one sheet is sufficient, an effect that simplification and cost reduction of structure can be planned is acquired.

[0009] In this case, an effect that a component side of each driver IC can be made advantageous on the stability of connection resistance and reduction in resistance by preparing at this element substrate is acquired considering the 1st substrate as an element substrate with much metal wiring.

[0010] Liquid crystal equipment concerning claim 2 is characterized by having mixed a conductive particle in said sealant and constituting said flow section in claim 1.

[0011] It is characterized by liquid crystal equipment concerning claim 3 being a resin layer which contains a conductive particle by which said flow section has been arranged on the outside of said sealant in claim 1.

[0012] Liquid crystal equipment concerning claim 4 is liquid crystal equipment which liquid crystal was enclosed through an annular sealant between the 1st substrate and the 2nd substrate, and equipped said the 1st substrate and said 2nd substrate with a component side of a driver IC, respectively, and is characterized by pulling out wiring by the side of an input terminal of a driver IC mounted in said 2nd substrate to a component side of said 1st substrate through the flow section.

[0013] According to this means, since FPC of one sheet is sufficient, an effect that simplification and cost reduction of structure can be planned is acquired.

[0014] Liquid crystal equipment concerning claim 5 is characterized by for said 1st substrate being an element substrate which has a switching element, and being the opposite substrate with which said 2nd substrate counters said element substrate, and is arranged.

[0015]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to drawing. An explanatory perspective diagram for an explanatory perspective diagram for an explanatory perspective diagram for drawing 1 to explain the liquid crystal equipment which is the gestalt of operation of the 1st mode of this invention, and drawing 2 to explain the II–II line cross section of drawing 1 , and for drawing 3 explain the modification of the flow section, and drawing 4 to explain the liquid crystal equipment the IV–IV line cross section of drawing 3 and whose drawing 5 are the gestalten of operation of the 2nd mode of this invention, and drawing 6 are the VI–VI line cross sections of drawing 5 .

[0016] First, with reference to drawing 1 and drawing 2 , it explains from the liquid crystal equipment which is the gestalt of operation of the 1st mode of this invention.

[0017] This liquid crystal equipment between the opposite substrates (the 2nd substrate) 21 by which opposite arrangement was carried out at this element substrate (1st substrate) 20 and element substrate 20 bottom Liquid crystal 23 is enclosed through the rectangular–head annular sealant 22 in which the liquid crystal impregnation section which is not illustrated was prepared. Project X side of the element substrate 20 in the direction of Y from X side of the opposite substrate 21, and two driver ICs 24 estrange mutually in the direction of X on the upper surface of this lobe, and it is mounted by the COG (chip–on glass) method. Y sides of the element substrate 20 are projected in the direction of X from Y sides of the opposite substrate 21, two driver ICs 25 estrange them mutually in the direction of Y on the upper surface of this lobe, and COG mounting is carried out.

[0018] Two or more trains arrangement of the pixel electrode (electrode of the 1st substrate) 26 by which two or more formation was carried out at the predetermined gap in the direction of Y inside the sealant 22 of the upper surface of the element substrate 20 is carried out in the direction of X, and this pixel electrode 26 is connected to the output terminal of a driver IC 24 through the data line 28 prolonged in the TFD element 27 and the direction of Y. Moreover, two or more formation is carried out on the inferior surface of tongue of the opposite substrate 21 so that the data line of an element substrate may be intersected and the electrode 29 by the side of a scan in the direction of Y (electrode of the 2nd substrate) may lap with the pixel electrode 26 superficially.

[0019] Here, conductive particle 22a is mixed in the portion prolonged in the direction of Y in a driver IC 25 side among the rectangular–head annular sealants 22, and the flow section 30 consists of gestalten of this

operation. The electrode terminal area of the scan lateral electrode 29 touches the flow section 30 bottom, and thereby, while the electrode terminal area of the scan lateral electrode 29 is pulled out by the element substrate 20 through the flow section 30, it connects with the output terminal of a driver IC 25 through the metal wiring 31 formed in the component side by the side of Y sides of the element substrate 20.

[0020] The input terminal of a driver IC 24 is connected to FPC (flexible printed circuit board)33 attached X side of this element substrate 20 through the metal wiring 32 formed in the component side by the side of X side of the element substrate 20. The input terminal of a driver IC 25 is connected to FPC33 through the metal wiring 34 formed in the component side by the side of Y sides of the element substrate 20, and, thereby, each input terminal of driver ICs 24 and 25 is connected to common FPC33 through the metal wiring 32 and 34.

[0021] Since FPC33 of one sheet is sufficient, in the liquid crystal equipment of the gestalt of this operation, simplification and cost reduction of structure can be planned, so that clearly from the above-mentioned publication.

[0022] Moreover, since the component side of driver ICs 24 and 25 is prepared in the element substrate 20 side with much metal wiring, it can consider as an advantageous thing on the stability of connection resistance, and the reduction in resistance.

[0023] In addition, although the case where used the 1st substrate as the element substrate 20, and the component side of driver ICs 24 and 25 was prepared in the element substrate 20 side by using the 2nd substrate as the opposite substrate 21 was taken for the example with the gestalt of the above-mentioned implementation It replaces with this, and the 1st substrate is used as an opposite substrate, the component side of driver ICs 24 and 25 is prepared in an opposite substrate by using the 2nd substrate as an element substrate, and you may make it attach FPC in this opposite substrate side. In this case, although illustration is omitted, the driver IC 24 which pulls out the data line of an element substrate to an opposite substrate through the flow section, and is connected to this opposite substrate at the pixel electrode of an element substrate is mounted.

[0024] Moreover, although conductive particle 22a is mixed in a sealant 22 and the flow section 30 is constituted from a gestalt of the above-mentioned implementation In the outside location of the portion prolonged in the direction of Y in a driver IC 25 side among the rectangular-head annular sealants 22 as it replaces with this, for example, is shown in drawing 3 and drawing 4 ACF (anisotropy electric conduction film) which is a resin layer containing conductive particle 22a is made to extend along the direction of Y between the element substrate 20 and the opposite substrate 21, and it is good for it also considering this as the flow section 35.

[0025] When the liquid crystal equipment which is the gestalt of operation of the 2nd mode of this invention is explained with reference to drawing 5 and drawing 6 , next, this liquid crystal equipment Liquid crystal 53 is enclosed with this element substrate (1st substrate) 50 and element substrate 50 bottom through the rectangular-head annular sealant 52 between the opposite substrates (the 2nd substrate) 51 by which opposite arrangement was carried out. Project X side of the element substrate 50 in the direction of Y from X side of the opposite substrate 51, and two driver ICs 54 estrange it mutually [the direction of X] on the upper surface of this lobe, and COG (chip-on glass) mounting is carried out. Y sides of the opposite substrate 51 are projected in the direction of X from Y sides of the element substrate 50, two driver ICs 55 estrange them mutually in the direction of Y on the inferior surface of tongue of this lobe, and COG mounting is carried out.

[0026] Inside the sealant 52 of the upper surface of the element substrate 50, two or more trains arrangement of the pixel electrode (electrode of the 1st substrate) 56 by which two or more formation was carried out at equal intervals is carried out in the direction of X in the direction of Y, and this pixel electrode 56 is connected to the output terminal of a driver IC 54 through the data line 58 prolonged in the TFD element 57 and the direction of Y. Moreover, two or more formation of the electrode 59 by the side of the scan prolonged in the direction of X so that the pixel electrode 56 may be covered in the inferior surface of tongue of the opposite substrate 51 (electrode of the 2nd substrate) is carried out at equal intervals in the direction of Y, and the electrode terminal area of this scan lateral electrode 59 is

connected to the output terminal of a driver IC 55 through the metal wiring 60 formed in the component side by the side of the opposite substrate 51.

[0027] The input terminal of a driver IC 54 is connected to FPC (flexible printed circuit board)62 attached X side of this element substrate 50 through the metal wiring 61 formed in the component side of the element substrate 50. On the other hand, the metal wiring 63 by the side of the input terminal of the driver IC 55 formed in the component side of the opposite substrate 51 The conductive particle which intervened between the element substrate 50 and the opposite substrate 51 in the outside location of a sealant 52 (it does not illustrate.) While being pulled out by the component side of the element substrate 50 through the flow section (ACF) 64 which is the resin layer to contain It connects with FPC62 through the metal wiring 65 formed in the component side of the element substrate 50, and, thereby, each input terminal of driver ICs 54 and 55 is connected to common FPC62 through ACF64 and the metal wiring 61, 63, and 65.

[0028] Since FPC62 of one sheet is sufficient, in the liquid crystal equipment of the gestalt of this operation, simplification and cost reduction of structure can be planned, so that clearly from the above-mentioned publication.

[0029] In addition, although the case where used the 1st substrate as the element substrate 50, and the 2nd substrate was used as the opposite substrate 51 was taken for the example with the gestalt of the above-mentioned implementation, it is not limited to this, but the 1st substrate is used as an opposite substrate and you may make it attach FPC62 in an opposite substrate side by using the 2nd substrate as an element substrate. In this case, although illustration is omitted The input terminal of a driver IC 55 is connected to FPC62 attached in Y sides of this opposite substrate 51 through the metal wiring formed in the component side of the opposite substrate 51. It connects with FPC62 through the metal wiring which pulled out the metal wiring by the side of the input terminal of the driver IC 54 formed in the component side of the element substrate 50 to the component side of the opposite substrate 51 through ACF64, and was formed in the component side of this opposite substrate 51.

[0030]

[Effect of the Invention] Since FPC of one sheet is sufficient according to this invention so that clearly from the above-mentioned explanation, the effect that simplification and cost reduction of structure can be planned is acquired.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is an explanatory perspective diagram for explaining the liquid crystal equipment which is the gestalt of operation of the 1st mode of this invention.
[Drawing 2] It is the II–II line cross section of drawing 1 .
[Drawing 3] It is an explanatory perspective diagram for explaining the modification of the flow section.
[Drawing 4] It is the IV–IV line cross section of drawing 3 .
[Drawing 5] It is an explanatory perspective diagram for explaining the liquid crystal equipment which is the gestalt of operation of the 2nd mode of this invention.
[Drawing 6] It is the VI–VI line cross section of drawing 5 .
[Drawing 7] It is an explanatory perspective diagram for explaining conventional liquid crystal equipment.
[Description of Notations]
20 50 -- Element substrate (the 1st substrate)
21 51 -- Opposite substrate (the 2nd substrate)
22 52 -- Sealant
23 53 -- Liquid crystal
26 56 -- Pixel electrode (electrode of the 1st substrate)
24, 25, 54, 55 -- Driver IC
29 59 -- Scan lateral electrode (electrode of the 2nd substrate)
30, 35, 64 -- Flow section

[Translation done.]

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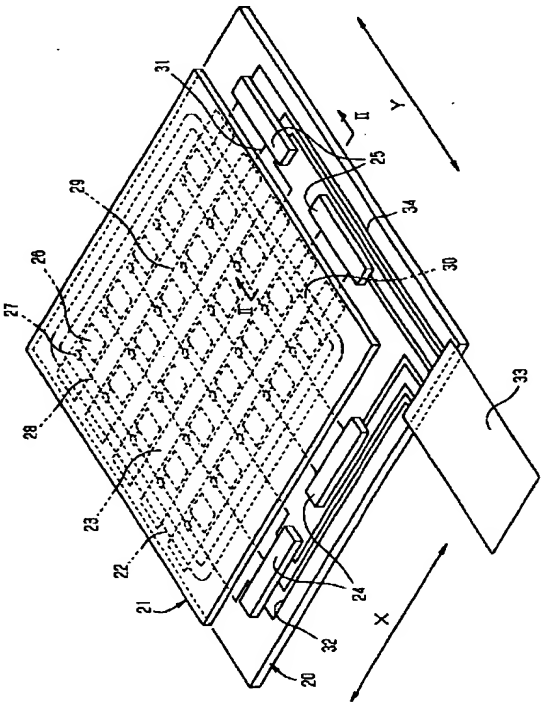
(54)【発明の名称】　液晶装置

(57)【要約】
【課題】　ＦＰＣが一枚で足りるようにして構造の簡略化及びコストの低減を図る。
【解決手段】　素子基板２０と対向基板２１との間に環状のシール材２２を介して液晶２３が封入され、素子基板２０の画素電極２６に接続されるドライバＩＣ２４の実装面及び対向基板２１の走査側電極２９に接続されるドライバＩＣ２５の実装面を備えた液晶装置であって、素子基板２０に該素子基板２０の画素電極２６に接続されるドライバＩＣ２４を実装するとともに、対向基板２１の電極端子部を導通部３０を介して素子基板２０に引き出して該素子基板２０に対向基板２１の走査側電極２９に接続されるドライバＩＣ２５を実装する。



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【特許請求の範囲】

【請求項１】　第１の基板と第２の基板との間に環状のシール材を介して液晶が封入され、前記第１の基板の電極に接続されるドライバＩＣの実装面及び前記第２の基板の電極に接続されるドライバＩＣの実装面を備えた液晶装置であって、

前記第１の基板に該第１の基板の電極に接続されるドライバＩＣを実装するとともに、前記第２の基板の電極端子部を導通部を介して前記第１の基板に引き出して該第１の基板に前記第２の基板の電極に接続されるドライバＩＣを実装したことを特徴とする液晶装置。

【請求項２】　前記シール材に導電性粒子を混入して前記導通部を構成したことを特徴とする請求項１記載の液晶装置。

【請求項３】　前記導通部は、前記シール材の外側に配置された導電性粒子を含有する樹脂層であることを特徴とする請求項１記載の液晶装置。

【請求項４】　第１の基板と第２の基板との間に環状のシール材を介して液晶が封入され、前記第１の基板及び前記第２の基板にそれぞれドライバＩＣの実装面を備えた液晶装置であって、

前記第２の基板に実装されたドライバＩＣの入力端子側の配線を導通部を介して前記第１の基板の実装面に引き出したことを特徴とする液晶装置。

【請求項５】　前記第１の基板がスイッチング素子を有する素子基板であり、前記第２の基板が前記素子基板に対向して配置される対向基板であることを特徴とする請求項１～４のいずれか一項に記載の液晶装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、特にスイッチング素子を有する素子基板とそれに対向する対向基板との間にシール材を介して液晶が封入され、素子基板の電極に接続されるドライバＩＣの実装面及び対向基板の電極に接続されるドライバＩＣの実装面を備えた液晶装置に関する。

【０００２】

【従来の技術】従来のこの種の液晶装置としては、例えば図７に示すものが知られている。この液晶装置は、スイッチング素子として導電体－絶縁体－導電体構造を有するＴＦＤ（Thin Film Diode：薄膜ダイオード）素子が形成された素子基板１と該素子基板１の上側に対向配置された対向基板２との間に四角環状のシール材３を介して液晶４が封入されており、素子基板１のＸ辺は対向基板２のＸ辺からＹ方向に突出して該突出部の上面にドライバＩＣ５が実装され、対向基板２のＹ辺は素子基板１のＹ辺からＸ方向に突出して該突出部の下面にドライバＩＣ６が実装されている。

【０００３】ドライバＩＣ５の出力端子はＹ方向に延びるデータ線７及びＴＦＤ素子８を介して素子基板１側の

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電極である画素電極９に接続されており、ドライバＩＣ６の出力端子は画素電極９を覆うようにＸ方向に延びる対向基板２側の対向電極１０の電極端子部に金属配線１１を介して接続されている。

【０００４】一方、ドライバＩＣ５の入力端子は素子基板１のＸ辺に取り付けられたＦＰＣ（フレキシブルプリント基板）１２に金属配線１３を介して接続されており、ドライバＩＣ６の入力端子は対向基板２のＹ辺に取り付けられたＦＰＣ１４に金属配線１５を介して接続されている。

【０００５】

【発明が解決しようとする課題】しかしながら、かかる従来の液晶装置においては、素子基板１及び対向基板２にそれぞれ一枚ずつ合計２枚のＦＰＣを備える必要があるため、構造が複雑になるとともにコスト低減の妨げになっている。

【０００６】本発明はかかる不都合を解消するためになされたものであり、構造の簡略化及びコストの低減を図ることができる液晶装置を提供することを目的とする。

【０００７】

【課題を解決するための手段】かかる目的を達成するために、請求項１に係る液晶装置は、第１の基板と第２の基板との間に環状のシール材を介して液晶が封入され、前記第１の基板の電極に接続されるドライバＩＣの実装面及び前記第２の基板の電極に接続されるドライバＩＣの実装面を備えた液晶装置であって、前記第１の基板に該第１の基板の電極に接続されるドライバＩＣを実装するとともに、前記第２の基板の電極端子部を導通部を介して前記第１の基板に引き出して該第１の基板に前記第２の基板の電極に接続されるドライバＩＣを実装したことを特徴とする。

【０００８】この手段によれば、一枚のＦＰＣで足りるため、構造の簡略化とコスト低減を図ることができるという効果が得られる。

【０００９】この場合、第１の基板を金属配線の多い素子基板として、該素子基板に各ドライバＩＣの実装面を設けることにより、接続抵抗の安定性と低抵抗化の上で有利なものとすることができるという効果が得られる。

【００１０】請求項２に係る液晶装置は、請求項１において、前記シール材に導電性粒子を混入して前記導通部を構成したことを特徴とする。

【００１１】請求項３に係る液晶装置は、請求項１において、前記導通部は、前記シール材の外側に配置された導電性粒子を含有する樹脂層であることを特徴とする。

【００１２】請求項４に係る液晶装置は、第１の基板と第２の基板との間に環状のシール材を介して液晶が封入され、前記第１の基板及び前記第２の基板にそれぞれドライバＩＣの実装面を備えた液晶装置であって、前記第２の基板に実装されたドライバＩＣの入力端子側の配線を導通部を介して前記第１の基板の実装面に引き出した

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ことを特徴とする。

【００１３】この手段によれば、一枚のＦＰＣで足りるため、構造の簡略化とコスト低減を図ることができるという効果が得られる。

【００１４】請求項５に係る液晶装置は、前記第１の基板がスイッチング素子を有する素子基板であり、前記第２の基板が前記素子基板に対向して配置される対向基板であることを特徴とする。

【００１５】

【発明の実施の形態】以下、本発明の実施の形態を図を参照して説明する。図１は本発明の第１の態様の実施の形態である液晶装置を説明するための説明的斜視図、図２は図１のＩＩ－ＩＩ線断面図、図３は導通部の変形例を説明するための説明的斜視図、図４は図３のＩＶ－ＩＶ線断面図、図５は本発明の第２の態様の実施の形態である液晶装置を説明するための説明的斜視図、図６は図５のＶＩ－ＶＩ線断面図である。

【００１６】まず、図１及び図２を参照して本発明の第１の態様の実施の形態である液晶装置から説明する。

【００１７】この液晶装置は、素子基板（第１の基板）２０と該素子基板２０の上側に対向配置された対向基板（第２の基板）２１との間に、図示しない液晶注入部が設けられた四角環状のシール材２２を介して液晶２３が封入されており、素子基板２０のＸ辺は対向基板２１のＸ辺からＹ方向に突出して該突出部の上面に二個のドライバＩＣ２４がＸ方向に互いに離間してＣＯＧ（チップ・オン・グラス）方式により実装され、素子基板２０のＹ辺は対向基板２１のＹ辺からＸ方向に突出して該突出部の上面に二個のドライバＩＣ２５がＹ方向に互いに離間してＣＯＧ実装されている。

【００１８】素子基板２０の上面のシール材２２の内側にはＹ方向に所定の間隔で複数形成された画素電極（第１の基板の電極）２６がＸ方向に複数列配置されており、該画素電極２６はＴＦＤ素子２７及びＹ方向に延びるデータ線２８を介してドライバＩＣ２４の出力端子に接続されている。また、対向基板２１の下面には素子基板のデータ線と交差するようにＹ方向に走査側の電極（第２の基板の電極）２９が、画素電極２６と平面的に重なるように複数形成されている。

【００１９】ここで、この実施の形態では、四角環状のシール材２２のうちでドライバＩＣ２５側でＹ方向に延びる部分に導電性粒子２２ａを混入して導通部３０を構成している。導通部３０の上側には走査側電極２９の電極端子部が接触しており、これにより、走査側電極２９の電極端子部が導通部３０を介して素子基板２０に引き出されるとともに、素子基板２０のＹ辺側の実装面に形成された金属配線３１を介してドライバＩＣ２５の出力端子に接続されている。

【００２０】ドライバＩＣ２４の入力端子は素子基板２０のＸ辺側の実装面に形成された金属配線３２を介して

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該素子基板２０のＸ辺に取り付けられたＦＰＣ（フレキシブルプリント基板）３３に接続され、ドライバＩＣ２５の入力端子は素子基板２０のＹ辺側の実装面に形成された金属配線３４を介してＦＰＣ３３に接続されており、これにより、ドライバＩＣ２４，２５の各入力端子が金属配線３２，３４を介して共通のＦＰＣ３３に接続されている。

【００２１】上記の記載から明らかなように、この実施の形態の液晶装置においては、一枚のＦＰＣ３３で足りるため、構造の簡略化とコスト低減を図ることができる。

【００２２】また、ドライバＩＣ２４，２５の実装面を金属配線の多い素子基板２０側に設けているので、接続抵抗の安定性と低抵抗化の上で有利なものとすることができる。

【００２３】なお、上記実施の形態では、第１の基板を素子基板２０とし第２の基板を対向基板２１として、素子基板２０側にドライバＩＣ２４，２５の実装面を設けた場合を例に採ったが、これに代えて、第１の基板を対向基板とし第２の基板を素子基板として、ドライバＩＣ２４，２５の実装面を対向基板に設けて該対向基板側にＦＰＣを取り付けるようにしてもよい。この場合、図示は省略するが、素子基板のデータ線を導通部を介して対向基板に引き出して該対向基板に素子基板の画素電極に接続されるドライバＩＣ２４を実装する。

【００２４】また、上記実施の形態では、シール材２２に導電性粒子２２ａを混入して導通部３０を構成しているが、これに代えて、例えば図３及び図４に示すように、四角環状のシール材２２のうちでドライバＩＣ２５側でＹ方向に延びる部分の外側位置において、素子基板２０と対向基板２１との間に導電性粒子２２ａを含有する樹脂層であるＡＣＦ（異方性導電膜）をＹ方向に沿って延在させてこれを導通部３５としてもよい。

【００２５】次に、図５及び図６を参照して本発明の第２の態様の実施の形態である液晶装置を説明すると、この液晶装置は、素子基板（第１の基板）５０と該素子基板５０の上側に対向配置された対向基板（第２の基板）５１との間に四角環状のシール材５２を介して液晶５３が封入されており、素子基板５０のＸ辺は対向基板５１のＸ辺からＹ方向に突出して該突出部の上面に二個のドライバＩＣ５４がＸ方向の互いに離間してＣＯＧ（チップ・オン・グラス）実装され、対向基板５１のＹ辺は素子基板５０のＹ辺からＸ方向に突出して該突出部の下面に二個のドライバＩＣ５５がＹ方向に互いに離間してＣＯＧ実装されている。

【００２６】素子基板５０の上面のシール材５２の内側にはＹ方向に等間隔で複数形成された画素電極（第１の基板の電極）５６がＸ方向に複数列配置されており、該画素電極５６はＴＦＤ素子５７及びＹ方向に延びるデータ線５８を介してドライバＩＣ５４の出力端子に接続さ

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れている。また、対向基板５１の下面には画素電極５６を覆うようにＸ方向に延びる走査側の電極（第２の基板の電極）５９がＹ方向に等間隔で複数形成されており、該走査側電極５９の電極端子部は対向基板５１側の実装面に形成された金属配線６０を介してドライバＩＣ５５の出力端子に接続されている。

【００２７】ドライバＩＣ５４の入力端子は素子基板５０の実装面に形成された金属配線６１を介して該素子基板５０のＸ辺に取り付けられたＦＰＣ（フレキシブルプリント基板）６２に接続されている。一方、対向基板５１の実装面に形成されたドライバＩＣ５５の入力端子側の金属配線６３は、シール材５２の外側位置で素子基板５０と対向基板５１との間に介在された導電性粒子（図示せず。）を含有する樹脂層である導通部（ＡＣＦ）６４を介して素子基板５０の実装面に引き出されるとともに、素子基板５０の実装面に形成された金属配線６５を介してＦＰＣ６２に接続されており、これにより、ドライバＩＣ５４，５５の各入力端子がＡＣＦ６４及び金属配線６１，６３，６５を介して共通のＦＰＣ６２に接続されている。

【００２８】上記の記載から明らかなように、この実施の形態の液晶装置においては、一枚のＦＰＣ６２で足りるため、構造の簡略化とコスト低減を図ることができる。

【００２９】なお、上記実施の形態では、第１の基板を素子基板５０とし第２の基板を対向基板５１とした場合を例に採ったが、これに限定されず、第１の基板を対向基板とし第２の基板を素子基板として、対向基板側にＦＰＣ６２を取り付けるようにしてもよい。この場合、図示は省略するが、ドライバＩＣ５５の入力端子を対向基板５１の実装面に形成された金属配線を介して該対向基

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板５１のＹ辺に取り付けられたＦＰＣ６２に接続し、素子基板５０の実装面に形成されたドライバＩＣ５４の入力端子側の金属配線をＡＣＦ６４を介して対向基板５１の実装面に引き出して該対向基板５１の実装面に形成された金属配線を介してＦＰＣ６２に接続する。

【００３０】

【発明の効果】上記の説明から明らかなように、本発明によれば、一枚のＦＰＣで足りるため、構造の簡略化とコスト低減を図ることができるという効果が得られる。

【図面の簡単な説明】

【図１】本発明の第１の態様の実施の形態である液晶装置を説明するための説明的斜視図である。

【図２】図１のＩＩ－ＩＩ線断面図である。

【図３】導通部の変形例を説明するための説明的斜視図である。

【図４】図３のＩＶ－ＩＶ線断面図である。

【図５】本発明の第２の態様の実施の形態である液晶装置を説明するための説明的斜視図である。

【図６】図５のＶＩ－ＶＩ線断面図である。

【図７】従来の液晶装置を説明するための説明的斜視図である。

【符号の説明】

２０，５０…素子基板（第１の基板）

２１，５１…対向基板（第２の基板）

２２，５２…シール材

２３，５３…液晶

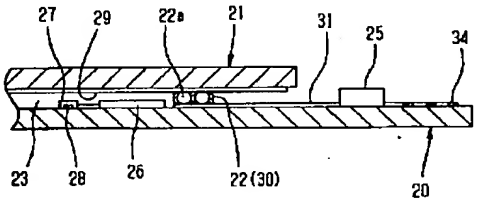
２６，５６…画素電極（第１の基板の電極）

２４，２５，５４，５５…ドライバＩＣ

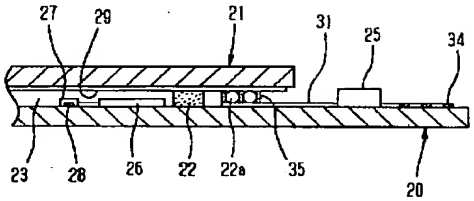
２９，５９…走査側電極（第２の基板の電極）

３０，３５，６４…導通部

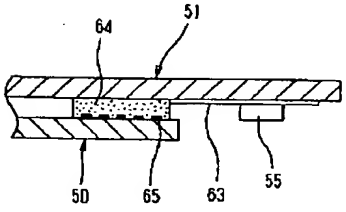
【図２】



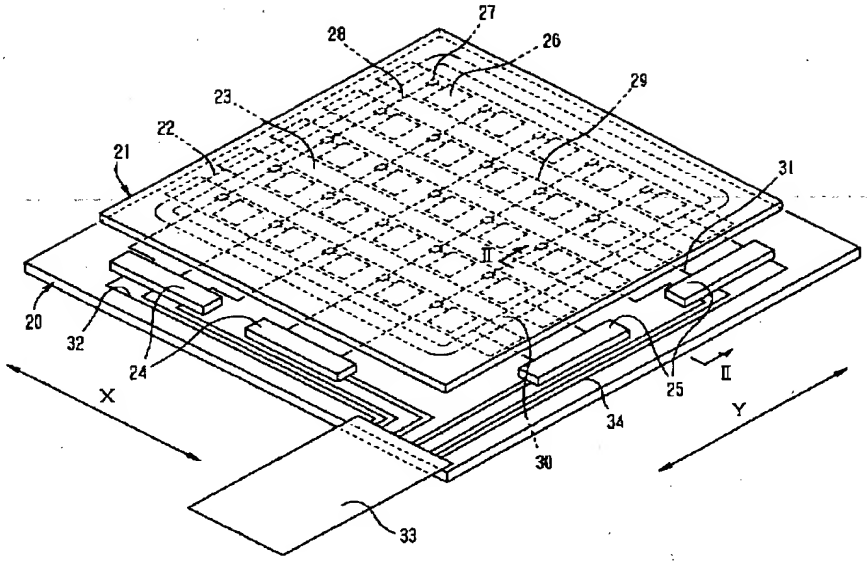
【図４】



【図６】



【図１】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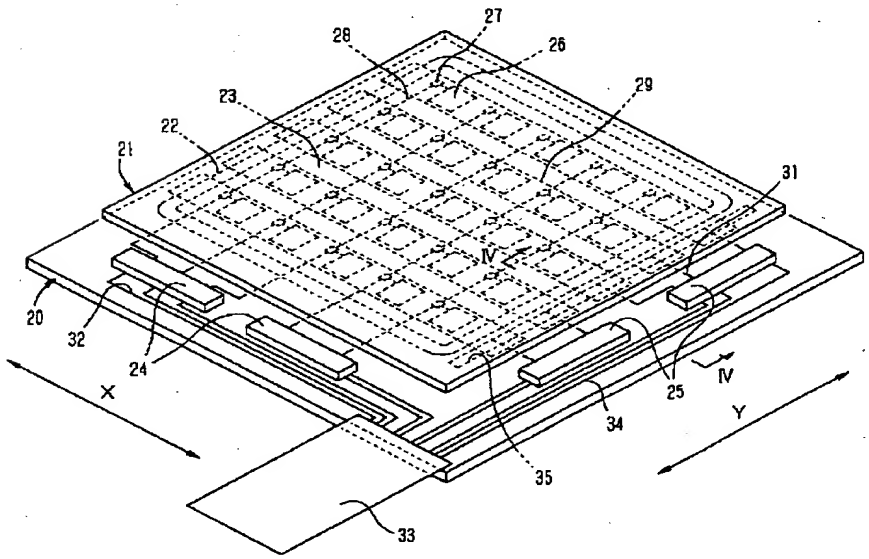
【図３】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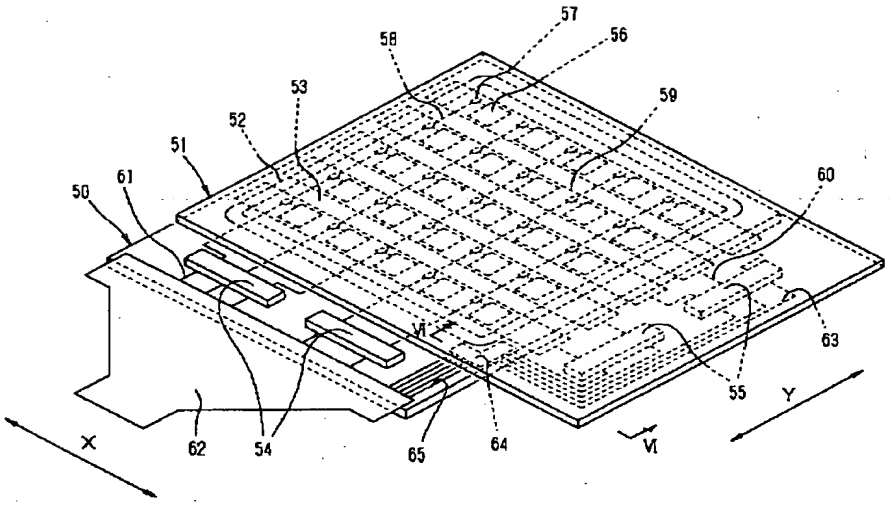
【図５】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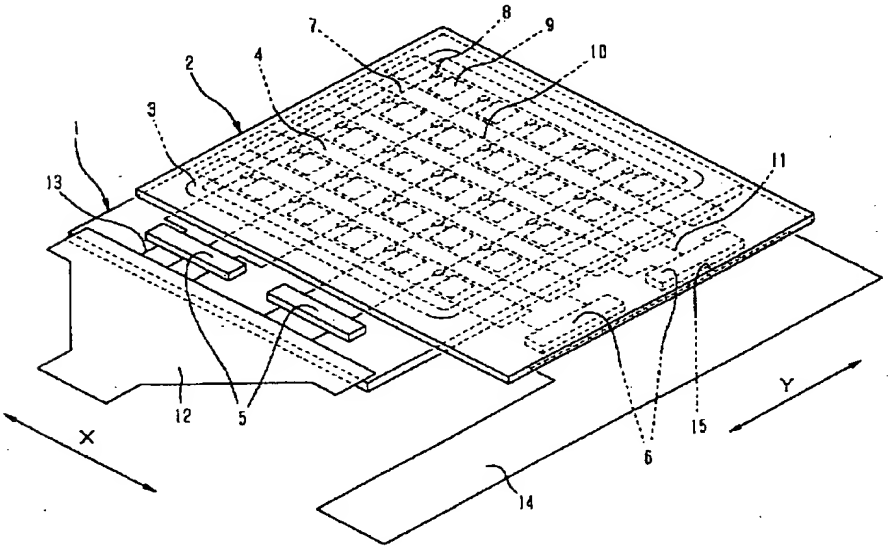
【図７】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